Environmental Criteria Manual - Part 1.4.5.P

Section 1-Water Quality Management 1.4.5.P Turbidity Curtain

1. Definition

A turbidity curtain is a temporary fabric curtain with very low permeability, installed in a waterway or waterbody to minimize sediment transport. Turbidity curtain is installed at an angle not greater than 45 degrees parallel to the direction to flow.

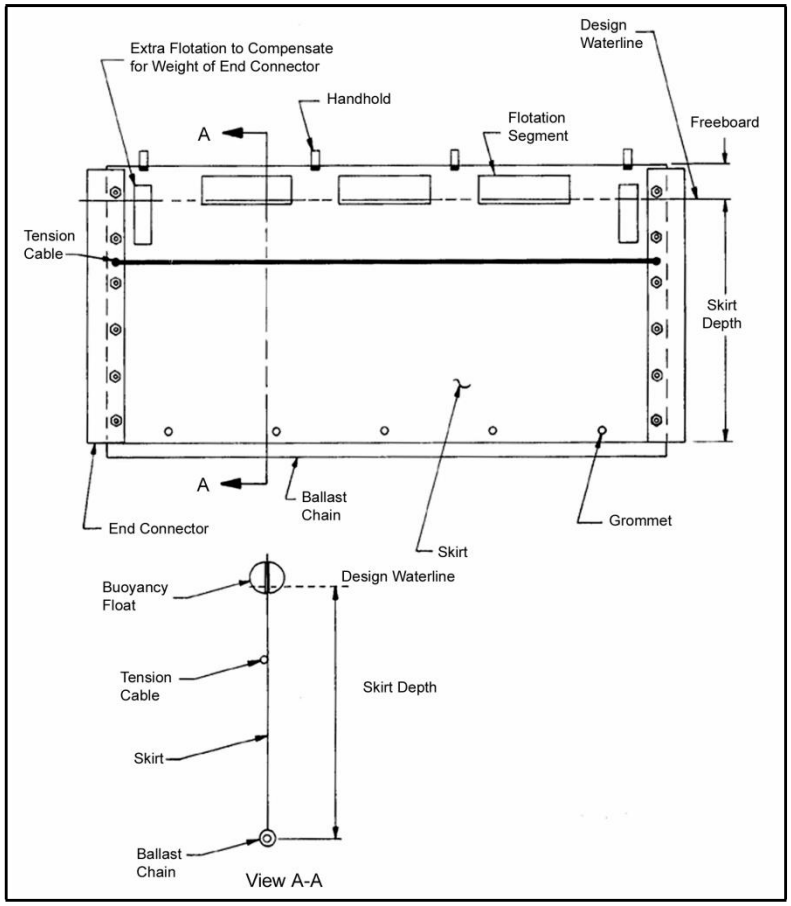

Figure 1.4.5.P.1 (JBF Scientific Corporation (1978)

2. Purpose

The purpose of this practice is to provide sediment containment while construction activities are occurring in or directly adjacent to a waterway or waterbody. Higher turbidity increases water temperatures because suspended particles absorb more heat. This, in turn, reduces the concentration of dissolved oxygen (DO) because warm water holds less DO than cold. Higher turbidity also reduces the amount of light penetrating the water, which reduces photosynthesis and the production of DO. Suspended materials can clog fish gills, reducing resistance to disease in fish, lowering growth rates, and affecting egg and larval development. As the particles settle, they can blanket the stream bottom, especially in slower waters, and smother fish eggs and benthic macroinvertebrates. http://water.epa.gov/type/rsl/monitoring/vms55.cfm

3. Conditions Where Practice Applies

This practice applies where construction activities are located within or adjacent to a perennial waterbody. This includes but is not limited to bridge construction, utility work, stream bank restoration, shoreline modification and dredging.

DOT Type II - "Moving Water" Floating Turbidity Curtains Permeable & Impermeable, are most commonly used for water conditions typical to Austin area lakes. This is slow to medium current applications, with currents in one direction & up to 5 feet/second, such as in rivers, and large lakes with moderate to strong winds and waves.

If the current exceeds 5 feet per second, other methods to divert flow away from the turbidity curtain such as temporary concrete traffic curtains, coffer dams, pumping, or sheet piling should be considered.

4. Design Criteria

This section establishes the minimum standards for design, installation and performance requirements.

A. Installation – Details of construction not listed in the text shall conform to the pertinent requirements of Figures Figure 1.4.5.P.2 and Figure 1.4.5.P.1. 3.

1) The curtain shall be installed before construction activities are initiated. Contactor will provide notice to the Environmental inspector 48 hours prior to installation and will include in the sequence of construction when the turbidity curtain will be installed.
2) The curtain shall remain in place and be maintained until the construction activity is completed and the disturbed area has stabilized.
3) The ends of the curtain shall be securely anchored and keyed into the shoreline to fully enclose the area where sediment may enter the water.
4) A turbidity curtain shall not be installed perpendicular to the direction of flow in a waterway or waterbody. Turbidity curtain shall be installed at an angle not greater than 45 degrees parallel to the direction to flow.
5) Driven posts shall be used to hold the curtain in position. The maximum spacing between posts shall be 10 feet. When curtain height exceeds 8 feet, post spacing may need to be decreased.
6) When bedrock prevents the installation of posts, float devices may be used. Flotation devices shall be flexible, buoyant units contained in an individual flotation sleeve or collar attached to the turbidity curtain. Use solid expanded polystyrene logs or equivalent having a 49 square inch minimum end area. Polystyrene beads or chips shall not be used as a flotation device. Buoyancy provided by the flotation devices shall be sufficient to support the weight of the turbidity curtain and maintain a freeboard of at least one third of the flotation device cross section above the water surface. Refer to Figure . Figure 1.4.5.P.2.
7) The curtain shall extend to the bottom of the water body when depth of water is eight feet or less. For application in waters exceeding eight feet in depth, the curtain may extend to

the desired depth, however the curtain shall not be required to exceed eight feet below the water surface unless special conditions warrant otherwise. The curtain shall be weighted at the bottom (as shown in Figure 1.4.5.P.1) to maintain the desired depth.

8) Ballast or anchors shall be used to hold the curtain in a vertical position. Bottom load lines may consist of a chain incorporated into the bottom hem of the screen, of sufficient weight to serve as ballast to hold the screen in a vertical position. Additional anchorage shall be provided if necessary
9) Danger buoys shall be used as required by Coast Guard regulations for navigable waterways or City Of Austin permit when working in navigable waters.

B. Plans and Specifications

Plans and specifications for installing a turbidity curtain shall be in keeping with this standard and attached detail drawing and shall describe the requirements for applying the practice to achieve its intended purpose:

1. Location of turbidity curtain.

2. Material specification conforming to standard C. Plans, standard detail drawings, and specifications shall include schedule sequence or notes for installation, inspection, and maintenance. The responsible party shall be identified.

C. Material

1) Components of the turbidity curtain system shall be clean and free of exotic species.
2) Top load lines shall consist of steel cable sufficient to support the load of the turbidity curtain system.
3) Fabric shall be selected according to the specifications in Table 1.

Table 1. Fabric Specifications for Turbidity Curtain

Requirement	Method	Value
Min. grab tensile strength	ASTM D 4632	200 lb (890 N)
Min. puncture strength	ASTM D 4833	90 lb (400 N)
Maximum permeability	ASTM D 4491	$\leq 1X10^{-7}$ cm/s
Min. ultraviolet stability	ASTM D 4355	70%

Source: WisDOT Spec 628.2.10.

D. Operation and Maintenance

1. Turbidity curtains shall be inspected daily by contractor and repaired/adjusted as necessary to maintain proper installation practice, compliance with site plan, and as directed by the City. 3rd party inspection shall be performed weekly and maintain inspection log.

2. Turbidity curtains shall not be removed until the water contained within the curtain has equal or lower turbidity than the waterway or waterbody, or if a flood event is imminent.

3. Care shall be taken when removing the curtain to minimize the release or re-suspension of sediment.

4. Turbidity curtains that have been previously used in other water bodies must be properly cleaned to prevent the spread of invasive exotic species from other sites. If any materials (including turbidity curtains, bouys and chains) they shall be disinfected with vinegar or cleaned with hot water greater than 104 deg. F then allowed to completely dry for a minimum period of five days. If there are any questions about the occurrence of zebra mussels (Dreissena polymorpha), , Giant salvinia (Salvinia molesta) or other aquatic invasive species in a waterbody that you have worked in, are working in, or intend to work in, contact Texas Parks and Wildlife.

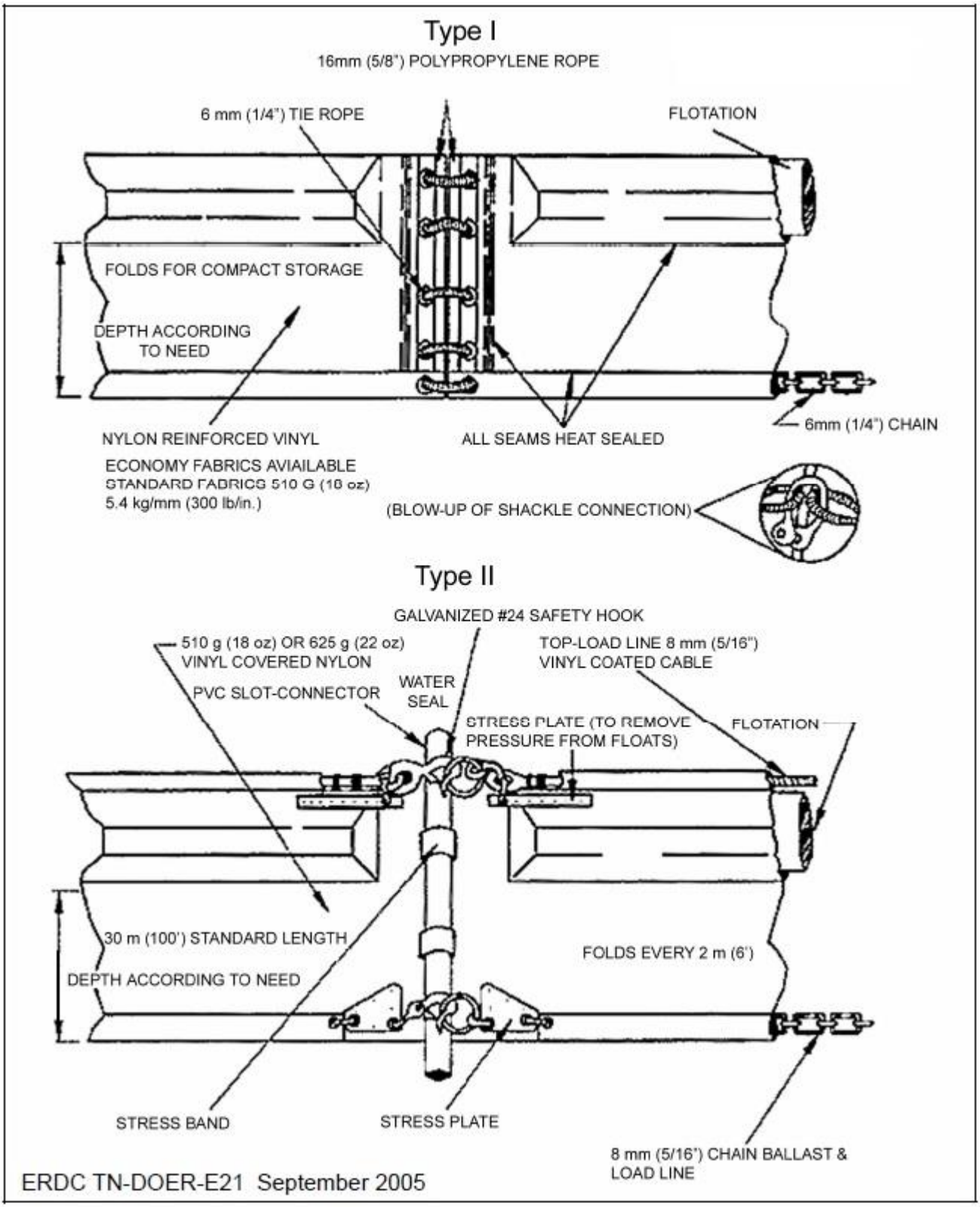

Figure 1.4.5.P. 2. Type I and II Turbidity Curtain

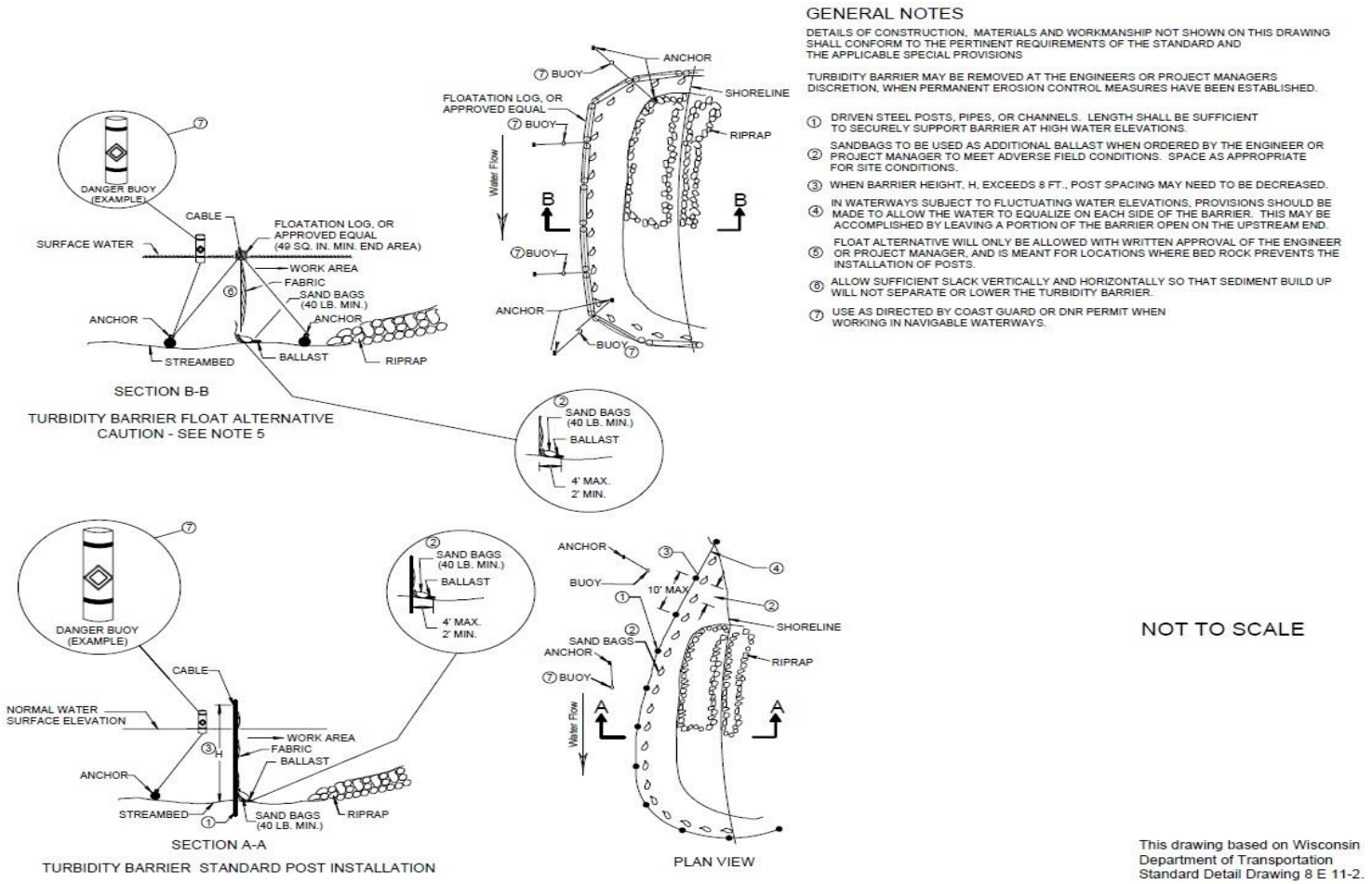

Figure 1.4.5.P.3. Turbidity Curtain Placement Details